

California Cooperative
Snow Surveys
Bulletin 120—2—98

State of California
The Resources Agency

Department of
Water Resources

Water Conditions in California

Report 2 March 1, 1998



Pete Wilson
Governor
State of California

Douglas P. Wheeler
Secretary for Resources
The Resources Agency

David N. Kennedy
Director
Department of Water Resources

STATE OF CALIFORNIA

Pete Wilson, Governor

THE RESOURCES AGENCY

Douglas P. Wheeler, Secretary for Resources

Department of Water Resources

David N. Kennedy, Director

Stephen L. Kashiwada
Deputy Director

Robert G. Potter
Chief Deputy Director

Raymond D. Hart
Deputy Director

L. Lucinda Chipponeri
Assistant Director for Legislation

Susan N. Weber
Chief Counsel

Division of Flood Management

George T. Qualley Chief
Maurice Roos Chief Hydrologist
Gary Hester Chief Forecaster

Prepared by

Frank Gehrke Chief, Snow Surveys
Robert R. Newton Associate Engineer, W.R.
J. Pierre Stephens Associate Engineer, W.R.
David M. Hart Water Resources Engineering Associate
Shawn T. Perkins Water Resources Technician II

COOPERATING AGENCIES

Public Agencies

Buena Vista Water Storage District
San Joaquin Exchange Contractors Water Association
East Bay Municipal Utility District
Friant Water Users Association
Kaweah Delta Water Conservation District
Kern Delta Water District
Kings River Conservation District
Lower Tule River Irrigation District
Merced Irrigation District
Modesto Irrigation District
Nevada Irrigation District
North Kern Water Storage District
Northern California Power Agency
Oakdale Irrigation District
Omochumne-Hartnell Water District
Oroville-Wyandotte Irrigation District
Placer County Water Agency
Sacramento Municipal Utility District
South San Joaquin Irrigation District
Tri-Dam Project
Tulare Lake Basin Water Storage District
Turlock Irrigation District
Yuba County Water Agency
Private Organizations
J.G. Boswell Company
Kaweah and St. Johns River Association
Kings River Water Association
Tule River Association
State Water Contractors

Municipalities

City of Bakersfield Water Department
City of Los Angeles Department of Water and Power
City and County of San Francisco Hetch Hetchy Water and Power

State Agencies

University of California, Central Sierra Snow Laboratory
California Department of Forestry & Fire Protection
California Department of Water Resources

Public Utilities

Pacific Gas and Electric Company
Southern California Edison Company

Federal Agencies

U.S. Department of Agriculture
Forest Service (14 National Forests)
Natural Resource Conservation Service
U.S. Department of Commerce
National Weather Service
U.S. Department of Interior
Bureau of Reclamation
Geological Survey, Water Resources
National Park Service (3 National Parks)
U.S. Department of Army
Corps of Engineers

Other Cooperative Programs

Nevada Cooperative Snow Surveys
Oregon Cooperative Snow Surveys

SUMMARY OF WATER CONDITIONS MARCH 1, 1998

February was even wetter than January with over three times normal precipitation. The storms came incessantly during the first three weeks, but were cool, which caused a major increase in mountain snowpack to levels comparable to 1993 and 1983 at this time. The water supply outlook for this year is excellent; indeed for some areas the problem may be too much spring runoff.

Forecasts of April through July runoff are now about one and one half times average statewide. The North Coast and southern Sierra runoff percentages are projected to be a little higher, but all regions share in the bounty. Water year runoff forecasts are also about one and one half times average.

Snowpack water content is about 185 percent of average statewide for this date and 160 percent of the April 1 average, which is typically the date of maximum accumulation. Water content percentages are quite large near the lower end of the snow zone, which may presage more than usual March snowmelt. Last year at this time the snowpack was 115 percent of average.

Precipitation during February was extremely heavy at 320 percent of average statewide, heavier in the south. The seasonal average since October 1 has risen to 170 percent compared to 145 percent one year ago..

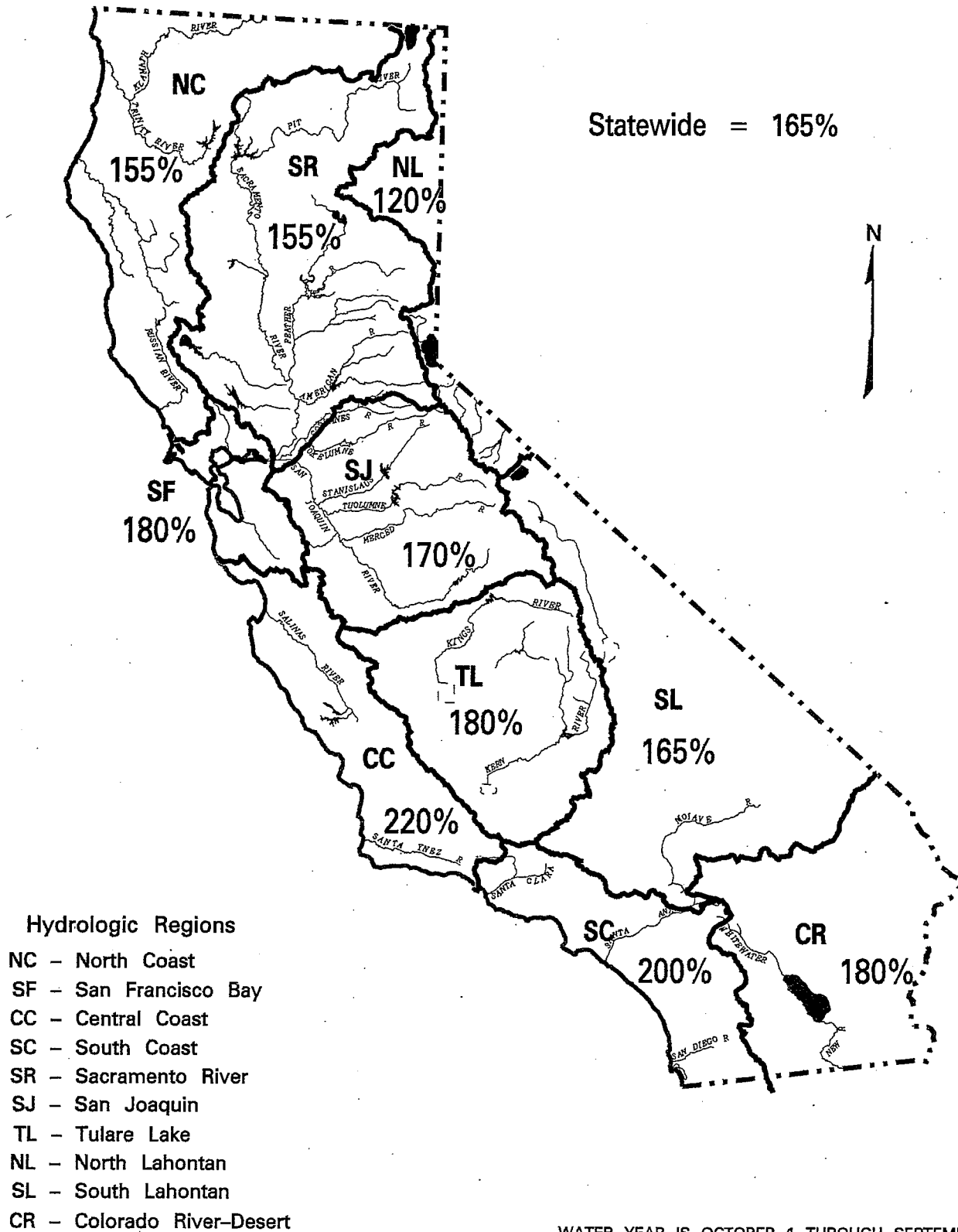
Runoff so far this season is 160 percent of average, less than the 230 percent last year. February runoff was about 250 percent of average for the month, a significant increase from the runoff rate in January. Estimated runoff of the 8 major rivers of the Sacramento and San Joaquin River regions during January was 7.4 million acre-feet.

Reservoir storage is now excellent at 120 percent of average overall for this date. Total storage last year also stood at 120 percent.

SUMMARY OF WATER CONDITIONS IN PERCENT OF AVERAGE

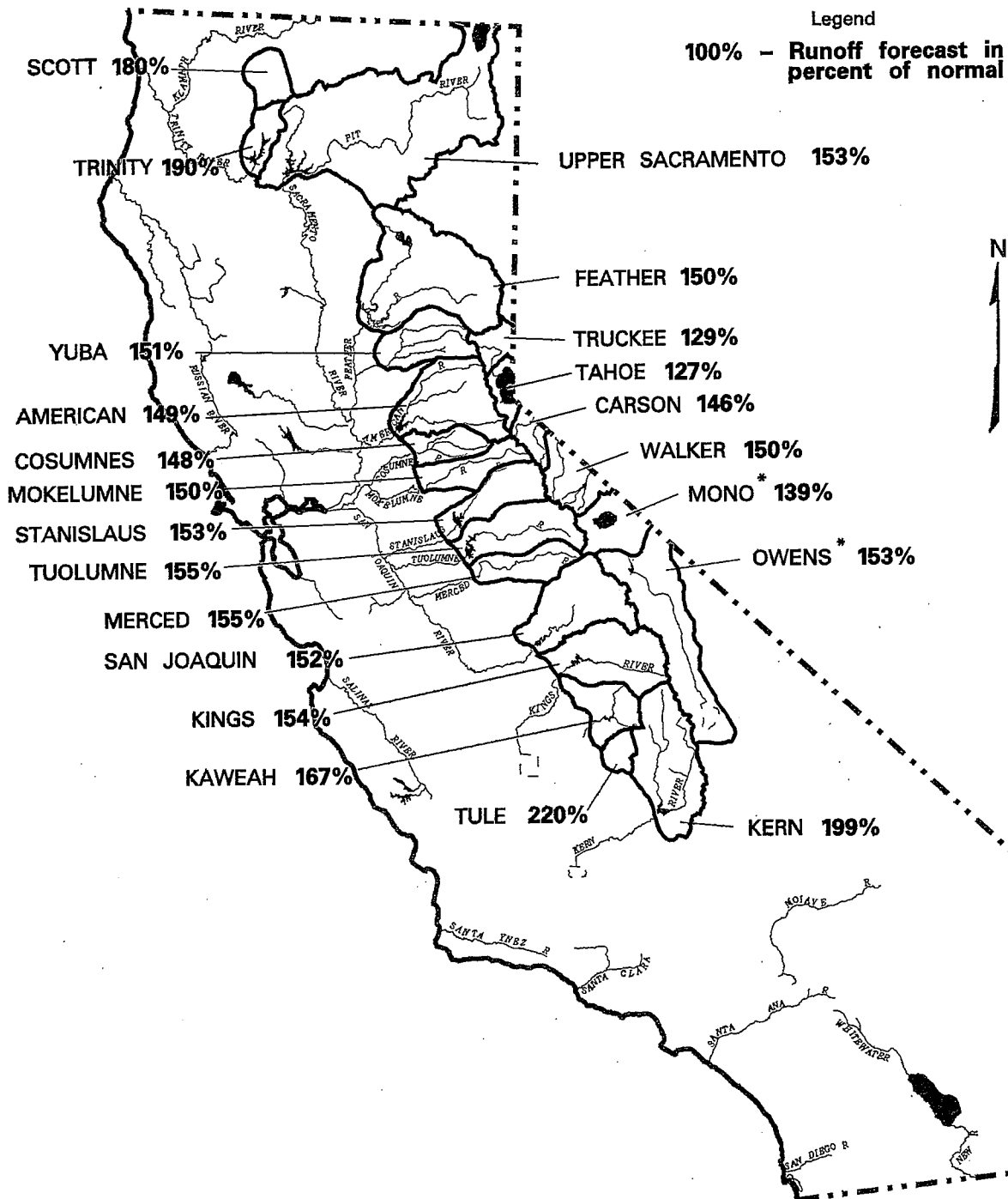
HYDROLOGIC REGION	PRECIPITATION OCTOBER 1 TO DATE	MARCH 1 SNOW WATER CONTENT	MARCH 1 RESERVOIR STORAGE	RUNOFF OCTOBER 1 TO DATE	APR-JULY RUNOFF FORECAST	WATER YEAR RUNOFF FORECAST
NORTH COAST	155	200	110	155	185	170
SAN FRANCISCO BAY	200	--	130	210	--	--
CENTRAL COAST	240	--	135	280	--	--
SOUTH COAST	195	--	130	150	--	--
SACRAMENTO RIVER	165	180	110	165	150	160
SAN JOAQUIN RIVER	170	185	125	145	155	155
TULARE LAKE	180	205	150	140	170	165
NORTH LAHONTAN	120	145	145	75	140	125
SOUTH LAHONTAN	180	170	100	105	150	140
COLORADO RIVER- DESERT	170	---	---	---	---	---
STATEWIDE	170	185	120	160	155	160

SEASONAL PRECIPITATION
 IN PERCENT OF AVERAGE TO DATE
 October 1, 1997 through March 31, 1998



WATER YEAR IS OCTOBER 1 THROUGH SEPTEMBER 30

FORECAST OF APRIL - JULY
UNIMPAIRED SNOWMELT RUNOFF
March 1, 1998



**APRIL 1, 1998 FORECASTS
APRIL-JULY UNIMPAIRED RUNOFF**

HYDROLOGIC REGION and Watershed	Unimpaired Runoff in 1,000 Acre-Feet (1)					
	HISTORICAL			FORECASTS		
	50 Yr Avg (2)	Max of Record	Min of Record	Apr-Jul Forecasts	Pct of Avg	80 % Probability Range (1)
SACRAMENTO RIVER						
Upper Sacramento River						
Sacramento River at Shasta Lake (3)	297	702	39	520	175%	
McCloud River at Shasta Lake	392	850	185	580	148%	
Pit River at Shasta Lake	1,056	1,796	480	1,420	134%	
Total Inflow to Shasta Lake	1,801	3,189	726	2,680	149%	2,300 - 3,360
Sacramento River above Bend Bridge, near Red Bluff	2,451	4,674	943	3,600	147%	3,080 - 4,520
Feather River						
Feather River at Lake Almanor near Prattville (3)	333	675	120	450	135%	
North Fork at Pulga (3)	1,028	2,416	243	1,400	136%	
Middle Fork near Clio (4)	86	518	4	120	140%	
South Fork at Ponderosa Dam (3)	110	267	13	150	136%	
Total Inflow to Oroville Reservoir	1,831	4,676	392	2,620	143%	2,270 - 3,340
Yuba River						
North Yuba below Goodyears Bar (3)	286	647	51	390	136%	
Inflow to Jackson Mdw and Bowman Reservoirs (3)	112	236	25	150	134%	
South Yuba at Langs Crossing (3)	233	481	57	290	124%	
Yuba River at Smartville	1,029	2,424	200	1,440	140%	1,270 - 1,830
American River						
North Fork at North Fork Dam (3)	262	716	43	370	141%	
Middle Fork near Auburn (3)	522	1,406	100	750	144%	
Silver Creek Below Camino Diversion Dam (3)	173	386	37	240	139%	
Total Inflow to Folsom Reservoir	1,261	3,074	229	1,820	144%	1,640 - 2,340
SAN JOAQUIN RIVER						
Cosumnes River at Michigan Bar	128	363	8	190	148%	150 - 260
Mokelumne River						
North Fork near West Point (5)	437	829	104	590	135%	
Total Inflow to Pardee Reservoir	459	1,065	102	670	146%	600 - 810
Stanislaus River						
Middle Fork below Beardsley Dam (3)	334	702	64	490	147%	
North Fork Inflow to McKays Point Dam (3)	224	503	34	330	147%	
Total Inflow to New Melones Reservoir	699	1,710	116	1,050	150%	940 - 1,270
Tuolumne River						
Cherry Creek & Eleanor Creek near Hetch Hetchy (3)	322	727	97	460	143%	
Tuolumne River near Hetch Hetchy (3)	606	1,392	153	900	149%	
Total Inflow to Don Pedro Reservoir	1,184	2,682	301	1,850	156%	1,700 - 2,160
Merced River						
Merced River at Pohono Bridge (3)	362	888	80	560	155%	
Total Inflow to Lake McClure	611	1,587	123	980	160%	900 - 1,180
San Joaquin River						
San Joaquin River at Mammoth Pool (6)	1,014	2,279	235	1,520	150%	
Big Creek below Huntington Lake (6)	95	264	11	150	158%	
South Fork near Florence Lake (6)	202	511	58	290	144%	
Total Inflow to Millerton Lake	1,212	3,355	262	1,940	160%	1,770 - 2,240
TULARE LAKE						
Kings River						
North Fork Kings River near Cliff Camp (3)	239	565	50	380	159%	
Total Inflow to Pine Flat Reservoir	1,183	3,114	273	1,910	161%	1,740 - 2,180
Kaweah River at Terminus Reservoir						
	276	814	61	480	174%	430 - 550
Tule River at Success Reservoir						
	59	256	2	145	246%	125 - 170
Kern River						
Kern River near Kernville (3)	373	1,203	83	750	201%	
Total Inflow to Isabella Reservoir	442	1,657	84	950	215%	880 - 1,080

(1) See inside back cover for definition

(2) All 50 year averages are based on years 1946-1995 unless otherwise noted

(3) 50 year average based on years 1941-90

(4) 44 year average based on years 1936-79

(5) 36 year average based on years 1936-72

(6) 45 year average based on years 1936-81

**MARCH 1, 1998 FORECASTS
WATER YEAR UNIMPAIRED RUNOFF**

Unimpaired Runoff in 1,000 Acre-Feet (1)													
HISTORICAL			DISTRIBUTION								FORECASTS		
50 Yr Avg (2)	Max of Record	Min of Record	Oct Thru Jan*	Feb *	Mar	Apr	May	Jun	Jul	Aug & Sep	Water Year Forecasts	Pct of Avg	80 % Probability Range (1)
856	1,964	165											
1,184	2,353	577											
3,078	5,150	1,484											
5,896	10,796	2,479	2,710	2,140	1,480	1,220	800	450	290	510	9,600	163%	8,600 - 11,050
8,518	17,180	3,294	4,280	3,960	2,080	1,620	1,040	600	380	640	14,600	171%	13,150 - 16,500
780	1,269	366											
2,417	4,400	666											
219	637	24											
291	562	32											
4,526	9,492	994	1,630	1,120	1,040	1,020	1,010	510	210	250	6,790	150%	6,050 - 8,100
564	1,056	102											
181	292	30											
379	565	98											
2,337	4,926	369	685	650	520	520	580	360	90	55	3,460	148%	3,000 - 4,250
616	1,234	66											
1,070	2,575	144											
318	705	59											
2,674	6,381	349	690	730	630	630	720	420	110	50	3,980	149%	3,360 - 5,000
378	1,253	20	120	217	110	100	65	20	5	3	640	169%	540 - 800
626	1,009	197											
736	1,800	129	105	135	145	180	270	200	40	15	1,090	148%	900 - 1,360
471	929	88											
1,131	2,952	155	200	250	210	280	420	280	90	30	1,760	156%	1,500 - 2,180
461	1,147	123											
770	1,661	258											
1,857	4,430	383	265	360	330	380	640	590	230	75	2,870	155%	2,500 - 3,500
461	1,020	92											
952	2,859	150	130	250	160	210	350	290	100	40	1,530	161%	1,350 - 1,900
1,337	2,964	308											
112	298	14											
248	653	71											
1,753	4,642	362	180	210	220	340	630	600	270	120	2,570	147%	2,180 - 3,220
284	607	58											
1,647	4,294	383	165	175	170	290	630	630	270	120	2,450	149%	2,050 - 3,050
431	1,402	92	60	80	70	100	170	140	50	20	690	160%	580 - 840
135	615	16	40	80	60	55	47	20	8	5	315	233%	260 - 370
558	1,577	163											
694	2,309	175	110	100	120	180	320	260	120	90	1,300	187%	1,100 - 1,600

* Indicates observed runoff

**APRIL 1, 1998 FORECASTS
APRIL-JULY UNIMPAIRED RUNOFF**

HYDROLOGIC REGION and Watershed	Unimpaired Runoff in 1,000 Acre-Feet (1)				
	HISTORICAL			FORECASTS	
	50 Yr Avg. (2)	Max of Record	Min of Record	Apr-Jul Forecasts	Pct of Avg
NORTH COAST					
Trinity River					
Total Inflow to Lewiston Lake	642	1,593	80	1,230	192%
Scott River					
Near Fort Jones	200	N/A	N/A	340	170%
Klamath River					
Total inflow to Upper Klamath Lake (3)	509	758	280	585	115%
NORTH LAHONTAN					
Truckee River					
Lake Tahoe to Farad accretions	264	713	58	350	133%
Lake Tahoe Rise (assuming gates closed, in feet) (4)	1.5	3.8	0.2	2.0	133%
Carson River					
West Fork at Woodfords	54	135	12	80	148%
East Fork near Gardnerville	183	407	43	270	148%
Walker River					
West Fork near Coleville	143	330	35	215	150%
East Fork near Bridgeport	61	209	7	110	180%
SOUTH LAHONTAN					
Owens River					
Total tributary flow to Owens River (5)	226	579	96	359	159%

(1) See inside back cover for definition

(2) All 50 year averages are based on years 1946-1995 unless otherwise noted

(3) Forecast by U.S. Natural Resources Conservation Service, Portland Oregon, 30 year average based on years 1961-1990.
April through September forecast.

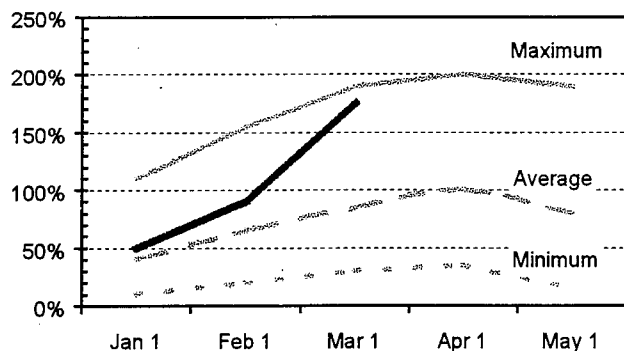
(4) 50 year average based on years 1941-1990

(5) Forecast by Department of Water and Power, City of Los Angeles

NORTH COAST REGION

Snowpack Accumulation

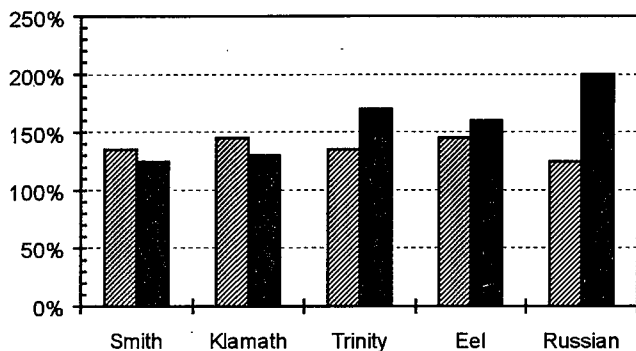
Water Content in % of April 1 average



SNOWPACK - First of the month measurements made at 7 snow courses indicate an area wide snow water equivalent of 52.9 inches. This is 200 percent of the March 1 average and 175 percent of the seasonal (April 1) average. Last year at this time the pack was holding 18.5 inches of water.

Precipitation

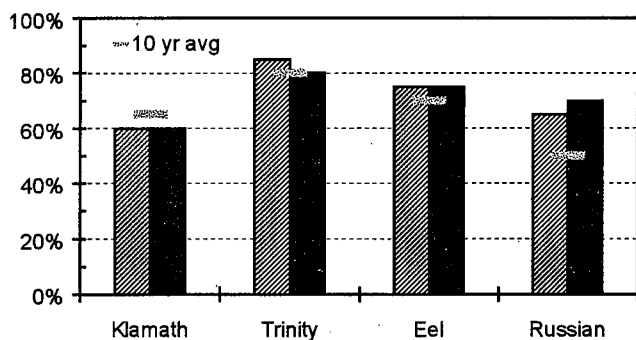
October 1 to date in % of average



PRECIPITATION - Seasonal precipitation (October 1 through the end of last month) on this area was 155 percent of normal. Precipitation last month was about 275 percent of the monthly average. Seasonal precipitation at this time last year stood at 135 percent of normal.

Reservoir Storage

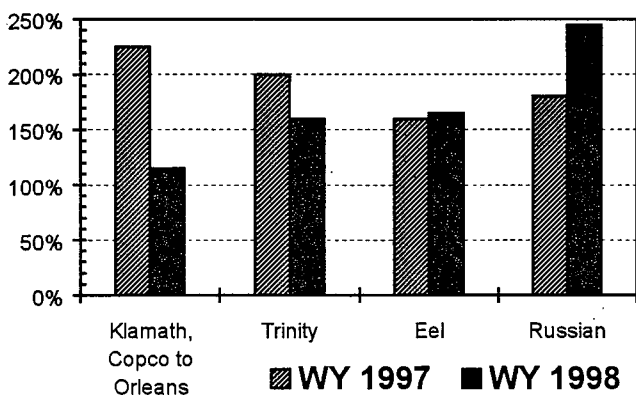
Contents of major reservoirs in % of capacity



RESERVOIR STORAGE - First of the month storage in 7 reservoirs was 2.5 million acre-feet which is 110 percent of average. About 80 percent of available capacity was being used. Storage in these reservoirs at this time last year was 110 percent of average.

Runoff

October 1 to date in % of average

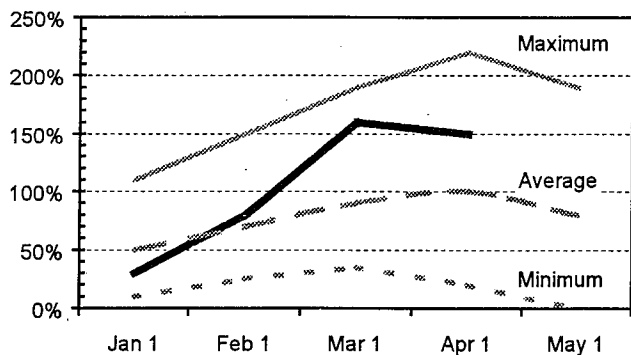


RUNOFF - Seasonal runoff of streams draining the area totaled 12 million acre-feet which is 155 percent of average for this period. Last year, runoff for the same period was 190 percent of average.

SACRAMENTO RIVER REGION

Snowpack Accumulation

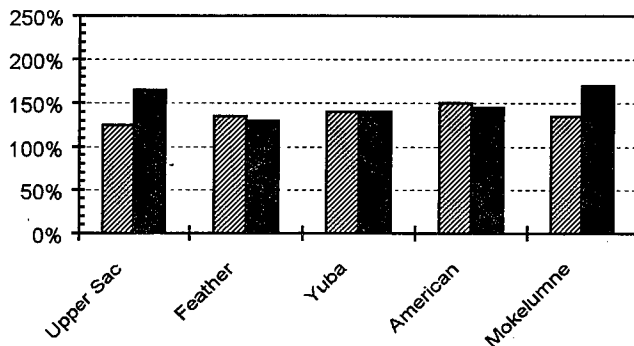
Water Content in % of April 1 average



SNOWPACK - First of the month measurements made at 81 snow courses indicate an area wide snow water equivalent of 42.7 inches. This is 150 percent of the April 1 average. Last year at this time the pack was holding 16.5 inches of water.

Precipitation

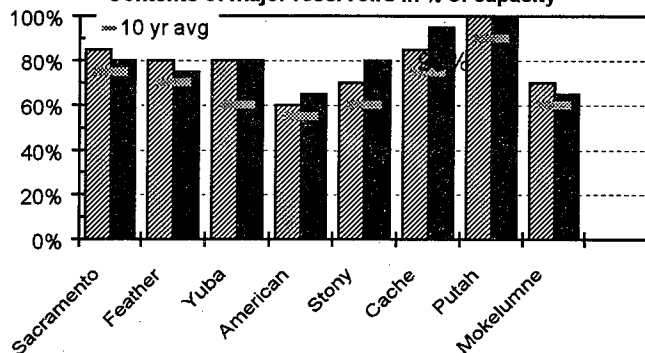
October 1 to date in % of average



PRECIPITATION - Seasonal precipitation (October 1 through the end of last month) on this area was 155 percent of normal. Precipitation last month was about 110 percent of the monthly average. Seasonal precipitation at this time last year stood at 130 percent of normal.

Reservoir Storage

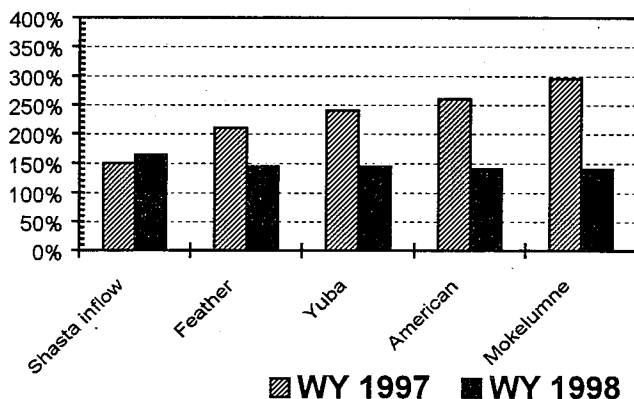
Contents of major reservoirs in % of capacity



RESERVOIR STORAGE - First of the month storage in 43 reservoirs was 12.7 million acre-feet which is 105 percent of average. About 80 percent of available capacity was being used. Storage in these reservoirs at this time last year was 105 percent of average.

Runoff

October 1 to date in % of average



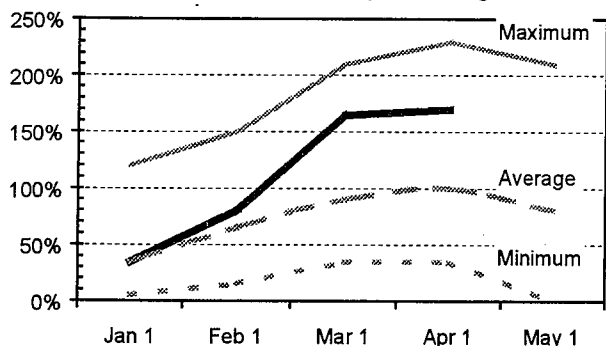
RUNOFF - Seasonal runoff of streams draining the area totaled 17.9 million acre-feet which is 165 percent of average for this period. Last year, runoff for the same period was 185 percent of average.

The Sacramento River Region **40-30-30 Water Supply Index** is forecast to be 12.2 million acre feet assuming median meteorological conditions for the remainder of the year. This classifies the year as "wet" in the Sacramento Valley according to the State Water Resources Control Board.

SAN JOAQUIN RIVER and TULARE LAKE REGIONS

Snowpack Accumulation

Water Content in % of April 1 average

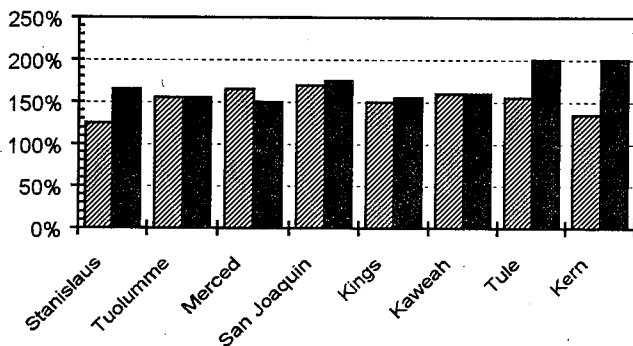


SNOWPACK - First of the month measurements made at 59 San Joaquin Region snow courses indicate an area wide snow water equivalent of 48.3 inches. This is 160 percent of average. Last year at this time the pack was holding 33.6 inches of water.

At the same time, 33 Tulare Lake Region snow courses indicated a basin-wide snow water equivalent of 40.7 inches which is 185 percent of average. Last year at this time the basin was holding 21.7 inches of water.

Precipitation

October 1 to date in % of average

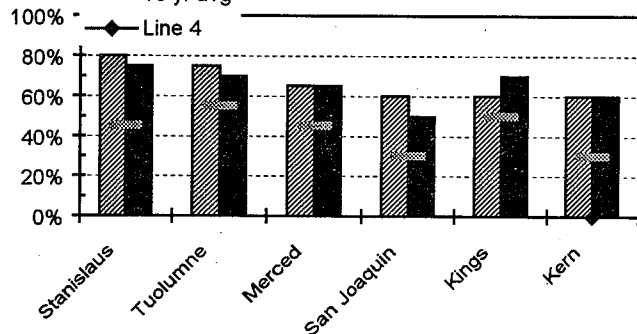


PRECIPITATION - Seasonal precipitation (October 1 through the end of last month) on the San Joaquin River Region was 170 percent of normal. Precipitation last month was about 145 percent of the monthly average. Seasonal precipitation at this time last year stood at 150 percent of normal.

Seasonal precipitation on the Tulare Lake Region was 180 percent of normal. Precipitation last month was 175 percent of the monthly average. Seasonal precipitation at this time last year stood at 145 percent of normal.

Reservoir Storage

Contents of major reservoirs in % of capacity
10 yr avg

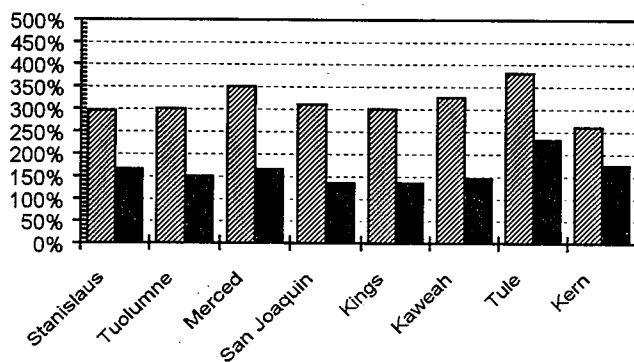


RESERVOIR STORAGE - First of the month storage in 33 San Joaquin River Region reservoirs was 8.5 million acre-feet which is 120 percent of average and about 75 percent of available capacity. Storage in these reservoirs at this time last year was 125 percent of average.

First of the month storage in 6 Tulare Lake Region reservoirs was 1.3 million acre-feet which is 160 percent of average and about 65 percent of available capacity. Storage in these reservoirs at this time last year was 145 percent of average.

Runoff

October 1 to date in % of average



■ WY 1997 ■ WY 1998

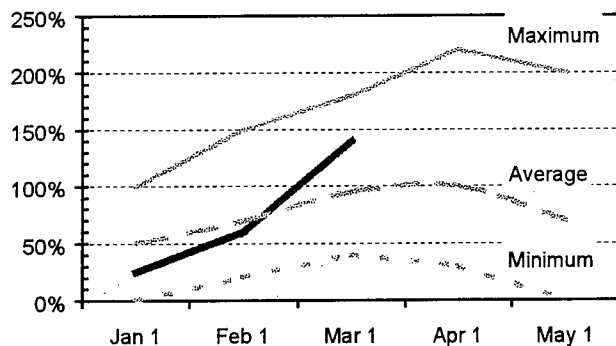
RUNOFF - Seasonal runoff of streams draining the San Joaquin River Region totaled 3.7 million acre-feet which is 155 percent of average for this period. Last year, runoff for the same period was 305 percent of average.

Stream runoff draining into the Tulare Lake Region totaled 1.3 million acre-feet which is 155 percent of average for this period. Last year, runoff for the same period was 300 percent of average.

The San Joaquin River Region 60-20-20 Water Supply Index is forecasted to be 4.9 million acre feet assuming median meteorological conditions for the remainder of the year. This classifies the year as "wet" in the San Joaquin Valley according to the State Water Resources Control Board.

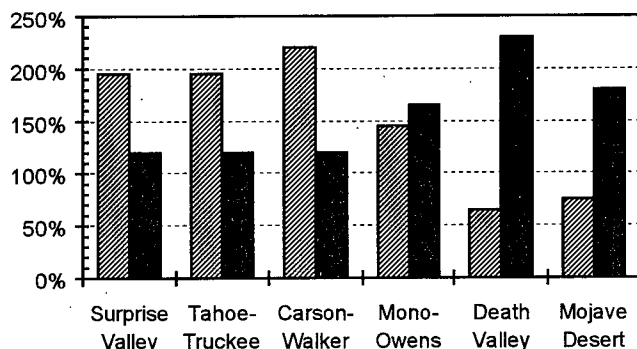
Snowpack Accumulation

Water Content in % of April 1 average



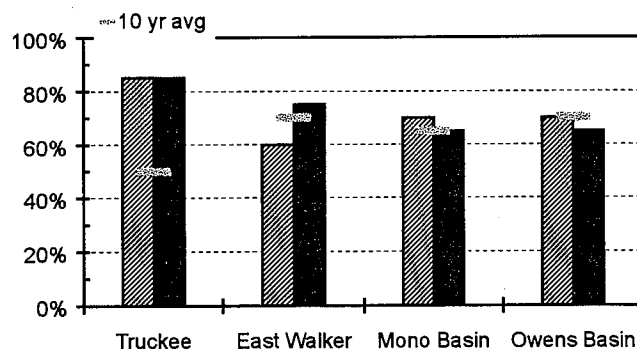
Precipitation

October 1 to date in % of average



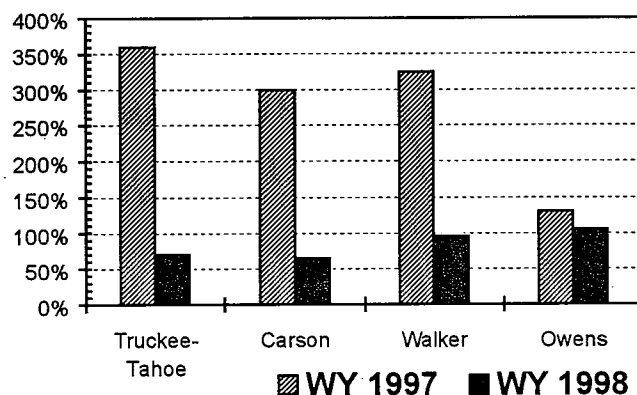
Reservoir Storage

Contents of major reservoirs in % of capacity



Runoff

October 1 to date in % of average



NORTH and SOUTH LAHONTAN REGIONS

SNOWPACK - First of the month measurements made at 13 North Lahontan snow courses indicate an area wide snow water equivalent of 36.1 inches. This is 145 percent of the March 1 average and 125 percent of the seasonal (April 1) average. Last year at this time the pack was holding 40.1 inches of water.

At the same time, 21 South Lahontan snow courses indicated a basin-wide snow water equivalent of 28.5 inches, which is 170 percent of the average for March 1 and 145 percent of the seasonal average. Last year at this time the pack was holding 34.7 inches of water.

PRECIPITATION - Seasonal precipitation (October 1 through the end of last month) on the North Lahontan Region was 120 percent of normal. Precipitation last month was about 230 percent of the monthly average. Seasonal precipitation at this time last year stood at 205 percent of normal.

Seasonal precipitation on the South Lahontan Region was 180 percent of normal. Precipitation last month was 465 percent of the monthly average. Seasonal precipitation at this time last year stood at 105 percent of normal.

RESERVOIR STORAGE - First of the month storage in 5 North Lahontan Region reservoirs was 865 thousand acre-feet which is 145 percent of average. About 80 percent of available capacity was being used. Storage in these reservoirs at this time last year was 155 percent of average. Lake Tahoe was 5.0 feet above its natural rim on March 1.

First of the month storage in 8 South Lahontan Region reservoirs was 285 thousand acre-feet which is 100 percent of average. About 70 percent of available capacity was being used. Storage in these reservoirs at this time last year was 80 percent of average.

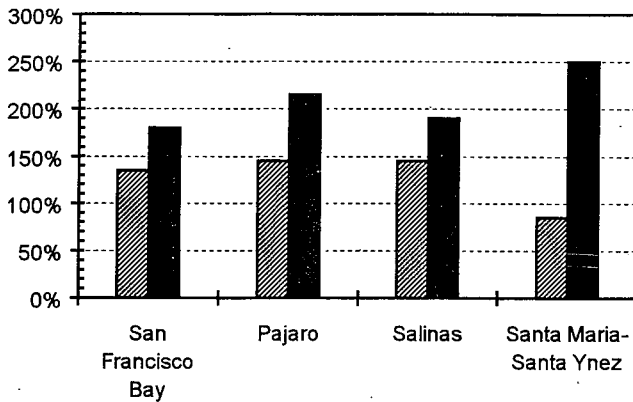
RUNOFF - Seasonal runoff of streams draining the North Lahontan area totaled 152 thousand acre-feet which is 75 percent of average for this period. Last year, runoff for the same period was 340 percent of average.

Seasonal runoff of the Owens River in the South Lahontan Region totaled 60 thousand acre-feet which is 105 percent of average for this period. Last year, runoff for this same period was 130 percent of average.

SAN FRANCISCO BAY and CENTRAL COAST REGIONS

Precipitation

October 1 to date in % of average

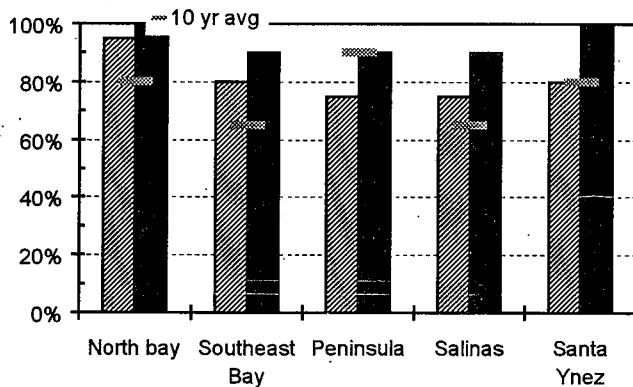


PRECIPITATION - Seasonal precipitation (October 1 through the end of last month) on the San Francisco Bay area was 180 percent of normal. Precipitation last month was about 80 percent of the monthly average. Seasonal precipitation at this time last year stood at 135 percent of normal.

Seasonal precipitation on the Central Coast area was 220 percent of normal. Precipitation last month was about 130 percent of the monthly average. Seasonal precipitation at this time last year stood at 130 percent of normal.

Reservoir Storage

Contents of major reservoirs in % of capacity

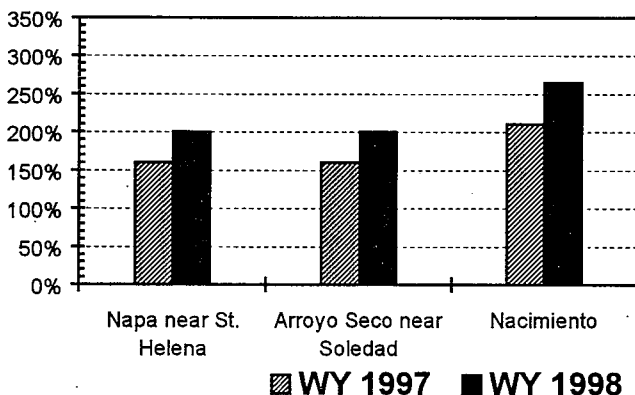


RESERVOIR STORAGE - First of the month storage in 18 major Bay area reservoirs was 634 thousand acre-feet which is 125 percent of average. About 90 percent of available capacity was being used. Storage in these reservoirs at this time last year was 110 percent of average.

First of the month storage in 6 major Central Coast reservoirs was 873 thousand acre-feet which is 130 percent of average. About 95 percent of available capacity was being used. Storage in these reservoirs at this time last year was 110 percent of average.

Runoff

October 1 to date in % of average



RUNOFF - Seasonal runoff of the Napa River in the San Francisco Bay area totaled 125 thousand acre-feet which is 200 percent of average for this period. Last year, runoff for the same period was 165 percent of average.

Seasonal runoff of selected Central Coast streams totaled 674 thousand acre-feet which is 240 percent of average for this period. Last year, runoff for the same period was 195 percent of average.

SOUTH COAST

PRECIPITATION - October through February (seasonal) precipitation on the South Coast area was 195 percent of normal. February precipitation was 400 percent of the monthly average. Seasonal precipitation at this time last year was 115 percent of normal. Seasonal precipitation in the Colorado Desert area was 170 percent of normal. Precipitation in February was 565 percent of average. Seasonal precipitation at this time last year stood at 65 percent of average.

RESERVOIR STORAGE - March 1 storage in 29 major South Coast area reservoirs was 1.7 million acre-feet or 130 percent of average. About 85 percent of available capacity was being used. Storage in these reservoirs at this time last year was 120 percent of average.

On March 1 combined storage in Lakes Powell, Mead, Mohave and Havasu was about 48 million acre-feet or 125 percent of average. About 90 percent of available capacity was in use. Last year at this time, these reservoirs were storing 115 percent of average.

RUNOFF - Seasonal runoff from selected South Coast streams totaled 45 thousand acre-feet which is 150 percent of average. Runoff from these streams during January totaled estimated 34 thousand acre-feet or 290 percent of average. Seasonal runoff from these streams last year was 115 percent of average.

COLORADO RIVER

The March 1 snowpack in the Upper Colorado River basin according to U. S. Natural Resources Conservation Service reports was 85 percent of average, highest in the Upper Colorado Headwaters at 90 percent and lowest in the Animas at 62 percent.

The April through July inflow to Lake Powell is forecast to be 7.4 million acre-feet, which is 96 percent of average.

CENTRAL VALLEY PROJECT

Based on March 1 conditions, Bureau of Reclamation water year forecasts for unimpaired runoff to CVP reservoirs are: Trinity--2.25 MAF (186% of average), Shasta--9.8 MAF (176% of average), American--4.08 MAF (154% of average), Stanislaus--1.76 MAF (153% of average), and San Joaquin above Friant--2.72 MAF (153% of average).

April-July forecasts for unimpaired runoff are: Trinity--1.15 MAF (191% of average), Shasta--2.8 MAF (161% of average), American--2.0 MAF (157% of average), Stanislaus--1.08 MAF (146% of average), and San Joaquin above Friant--1.95 MAF (153% of average).

As of February 28, 1998 CVP storage was 9.0 million acre feet which is approximately equal to storage of one year ago, and is approximately 123% of normal for that date.

The Bureau of Reclamation last updated water allocations for the CVP contractors on February 20, 1998. Based on conservative water supply forecasts prepared from information available February 10, 1998 CVP water allocations were: Agricultural contractors-80%; Urban contractors-100%; Sacramento River water rights and San Joaquin Exchange Contractors- 100%; Wildlife Refuges-100%.

STATE WATER PROJECT

State Water Project deliveries have been approved at about 2.95 million acre feet which meets at least 80 percent of most contractors' entitlement. This approval considered several factors, including the existing storage in SWP reservoirs, a conservative projection of hydrology and water supply expected to develop during the remainder of the 1997-98 water year, SWP operational constraints, and 1998 contractor demands. Approvals will be reevaluated with each new round of water supply forecasts.

MAJOR WATER DISTRIBUTION PROJECTS

RESERVOIR STORAGE

(AVERAGES BASED ON PERIOD RECORD)

RESERVOIR	CAPACITY 1,000 AF	AVERAGE	1997 1,000 AF	STORAGE AT END OF MARCH		
		STORAGE 1,000 AF		1998 1,000 AF	PERCENT AVERAGE	PERCENT CAPACITY
STATE WATER PROJECT						
Lake Oroville	3,538	2,817	2,962	2,812	100%	79%
San Luis Reservoir (SWP)	1,062	972	1,085	1,063	109%	100%
Lake Del Valle	77	37	39	40	107%	51%
Lake Silverwood	73	67	34	64	97%	88%
Pyramid Lake	171	159	161	164	103%	96%
Castaic Lake	324	283	291	320	113%	99%
Perris Lake	132	116	117	111	95%	84%
CENTRAL VALLEY PROJECT						
Trinity Lake	2,448	1,993	2,112	2,231	112%	91%
Lake Shasta	4,552	3,774	3,800	3,553	94%	78%
Whiskeytown Lake	241	213	204	207	97%	86%
Folsom Lake	977	636	470	680	107%	70%
New Melones Reservoir	2,420	1,538	2,022	1,999	130%	83%
Millerton Lake	520	307	275	426	139%	82%
San Luis Reservoir (CVP)	971	827	924	965	117%	99%
COLORADO RIVER PROJECT						
Lake Mead	26,159	19,651	22,786	25,046	127%	96%
Lake Powell	25,002	14,946	18,918	20,273	136%	81%
Lake Mohave	1,810	1,639	1,727	1,656	101%	91%
Lake Havasu	619	548	550	542	99%	88%
EAST BAY MUNICIPAL UTILITY DISTRICT						
Pardee Reservoir	198	179	176	199	111%	101%
Camanche Reservoir	417	260	230	239	92%	57%
East Bay (4 reservoirs)	151	132	118	143	109%	95%
CITY AND COUNTY OF SAN FRANCISCO						
Hetch-Hetchy Reservoir	360	123	226	136	110%	38%
Cherry Lake	268	109	187	138	126%	51%
Lake Eleanor	26	10	25	16	156%	62%
South Bay/Peninsula (4 reservoirs)	225	175	188	213	121%	95%
CITY OF LOS ANGELES (D.W.P.)						
Lake Crowley	183	130	121	130	100%	71%
Grant Lake	48	29	46	40	138%	85%
Other Aqueduct Storage (6 res.)	83	77	57	62	81%	75%

TELEMETERED SNOW WATER EQUIVALENTS

MARCH 1, 1998

(AVERAGES BASED ON PERIOD RECORD)

		INCHES OF WATER EQUIVALENT				
BASIN NAME		APRIL 1		PERCENT	24 HRS	1 WEEK
STATION NAME	ELEV	AVERAGE	MAR 1	OF AVERAGE	PREVIOUS	PREVIOUS
TRINITY RIVER						
Peterson Flat	7150'	29.2	44.3	152%	44.2	42.1
Red Rock Mountain	6700'	39.6	75.8	191%	75.8	73.9
Bonanza King	6450'	40.5	—	—	—	—
Shimmy Lake	6200'	40.3	—	—	—	—
Middle Boulder 3	6200'	28.3	—	—	—	—
Highland Lakes	6030'	29.9	73.4	246%	73.4	69.6
Scott Mountain	5900'	16.0	37.9	237%	37.9	36.6
Mumbo Basin	5700'	22.4	53.0	237%	52.9	49.7
Big Flat	5100'	15.8	37.4	237%	37.3	35.3
SACRAMENTO RIVER						
Cedar Pass	7100'	18.1	26.0	144%	25.8	24.8
Blacks Mountain	7100'	12.7	16.1	127%	16.1	15.4
Sand Flat	6750'	42.4	59.1	139%	59.1	56.5
Medicine Lake	6700'	32.6	—	—	—	—
Adin Mountain	6350'	13.6	20.2	149%	20.0	18.9
Snow Mountain	5950'	27.0	55.1	204%	55.1	52.8
Slate Creek	5600'	29.0	84.4	291%	83.4	77.9
Stouts Meadow	5400'	36.0	—	—	—	—
FEATHER RIVER						
Kettle Rock	7300'	25.5	43.7	171%	43.7	39.5
Grizzly Ridge	6900'	29.7	36.1	122%	35.9	—
Pilot Peak (DWR)	6800'	52.6	70.4	134%	70.2	65.9
Gold Lake	6750'	36.5	49.6	136%	49.6	47.2
Humbug	6500'	28.0	64.1	229%	64.0	61.0
Rattlesnake	6100'	14.0	38.5	275%	38.6	36.7
Bucks Lake	5750'	44.7	66.6	149%	66.4	61.4
Four Trees	5150'	20.0	47.6	238%	47.6	44.3
EEL RIVER						
Noel Spring	5100'	—	22.3	—	22.4	20.4
Plaskett Meadows	6000'	—	—	—	—	—
YUBA & AMERICAN RIVERS						
Lake Lois	8800'	39.5	—	—	—	—
Schneiders	8750'	34.5	49.0	142%	49.0	47.9
Caples Lake (DWR)	7800'	30.9	40.4	131%	40.4	38.8
Alpha	7600'	35.9	52.1	145%	52.1	50.0
Beta	7600'	35.9	48.8	136%	48.7	46.8
Meadow Lake	7200'	55.5	70.5	127%	69.9	67.9
Silver Lake (DWR)	7100'	22.7	39.3	173%	39.3	36.8
Central Sierra Snow Lab	6950'	33.6	46.4	138%	46.4	45.4
Huysink	6600'	42.6	46.5	109%	46.5	44.1
Van Vleck	6700'	35.9	50.0	139%	50.0	48.5
Robbs Saddle	5900'	21.4	—	—	—	—
Greek Store	5600'	21.0	34.8	166%	34.8	33.1
Blue Canyon	5280'	9.0	20.3	225%	20.3	18.9
Robbs Powerhouse	5150'	5.2	18.8	361%	18.8	18.0
MOKELUMNE & STANISLAUS RIVERS						
Deadman Creek	9250'	37.2	36.7	99%	36.7	34.8
Highland Meadow	8800'	47.9	52.5	110%	52.5	50.1
Gianelli Meadow	8350'	55.5	57.7	104%	57.7	55.5
Lower Relief Valley	8100'	41.2	52.7	128%	52.7	51.4
Blue Lakes	8000'	33.1	34.6	105%	34.6	33.2
Mud Lake	7900'	44.9	66.3	148%	66.2	64.6
Stanislaus Meadow	7750'	47.5	58.1	122%	58.1	56.2
Bloods Creek	7200'	35.5	40.5	114%	40.5	39.8
Black Springs	6500'	32.0	39.3	123%	39.3	38.0
TUOLUMNE & MERCED RIVERS						
Dana Meadows	9800'	27.7	34.0	123%	34.0	33.3
Slide Canyon	9200'	41.1	45.8	111%	45.8	43.8
Snow Flat	8700'	44.1	49.3	112%	49.3	47.3
Tuolumne Meadows	8600'	22.6	31.2	138%	31.3	30.6
Horse Meadow	8400'	48.6	55.0	113%	55.0	53.7
Ostrander Lake	8200'	34.8	45.4	130%	45.4	43.4
Paradise Meadow	7650'	41.3	—	—	—	—
Gin Flat	7050'	34.2	36.8	108%	36.7	35.0
Lower Kibbie Ridge	6600'	27.4	37.1	136%	37.1	36.5

TELEMETERED SNOW WATER EQUIVALENTS

APRIL 1, 1998

(AVERAGES BASED ON PERIOD RECORD)

		INCHES OF WATER EQUIVALENT				
BASIN NAME		APRIL 1		PERCENT	24 HRS	1 WEEK
STATION NAME	ELEV	AVERAGE	APR 1	OF AVERAGE	PREVIOUS	PREVIOUS
SAN JOAQUIN RIVER						
Volcanic Knob	10100'	30.1	43.8	145%	43.1	37.2
Agnew Pass	9450'	32.3	—	—	—	—
Kaiser Point	9200'	37.8	—	—	—	—
Green Mountain	7900'	30.8	45.0	146%	45.0	41.5
Tamarack Summit	7600'	30.5	45.3	148%	44.9	40.8
Chilkoot Meadow	7150'	38.0	—	—	—	48.0
Huntington Lake (USBR)	7000'	20.1	36.6	182%	36.2	32.5
Graveyard Meadow	6900'	18.8	35.6	190%	35.2	32.1
Poison Ridge	6900'	28.9	—	—	—	—
KINGS RIVER						
Bishop Pass	11200'	34.0	42.9	126%	42.2	37.0
Charlotte Lake	10400'	27.5	43.6	158%	43.1	38.3
State Lakes	10400'	29.0	58.4	201%	58.4	53.9
Mitchell Meadow	10375'	32.9	54.0	164%	54.0	48.9
Blackcap Basin	10300'	34.3	51.6	151%	51.6	46.4
Upper Burnt Corral	9700'	34.6	56.2	162%	55.5	51.0
West Woodchuck Meadow	9100'	32.8	50.4	154%	50.4	45.0
Big Meadows (DWR)	7600'	25.9	35.4	137%	35.4	32.5
KAWEAH & TULE RIVERS						
Quaking Aspen	7200'	21.0	40.1	191%	40.0	37.9
Giant Forest (Corps)	6400'	10.0	27.5	275%	27.2	24.1
KERN RIVER						
Upper Tyndall Creek	11500'	27.7	45.6	165%	45.0	42.5
Crabtree Meadow	10700'	19.8	—	—	—	—
Chagoopa Plateau	10300'	21.8	34.4	158%	34.4	32.5
Pascoes	9150'	24.9	55.0	221%	54.5	49.6
Tunnel Guard Station	8950'	15.6	26.5	170%	26.5	26.5
Wet Meadows	8900'	30.3	44.1	146%	44.1	43.2
Casa Vieja Meadows	8400'	20.9	34.6	166%	34.6	31.4
Beach Meadows	7650'	11.0	24.1	219%	24.1	24.4
SURPRISE VALLEY AREA						
Dismal Swamp	7050'	29.2	39.9	137%	40.1	37.8
TRUCKEE RIVER						
Mount Rose Ski Area	8850'	38.5	45.4	118%	45.3	43.7
Independence Lake (NRCS)	8450'	41.4	53.4	129%	53.4	50.6
Big Meadows (NRCS)	8700'	25.7	25.6	100%	25.7	22.9
Independence Camp	7000'	21.8	29.2	134%	29.2	27.3
Independence Creek	6500'	12.7	19.6	154%	19.6	19.2
LAKE TAHOE BASIN						
Heavenly Valley	8800'	28.1	35.0	125%	34.9	29.5
Hagans Meadow	8000'	16.5	24.0	145%	24.0	20.0
Marlette Lake	8000'	21.1	31.6	150%	31.6	27.7
Echo Peak 5	7800'	39.5	50.0	127%	49.9	49.2
Rubicon Peak 2	7500'	29.1	39.0	134%	38.9	35.7
Ward Creek 3	6750'	39.4	44.9	114%	45.0	40.7
Fallen Leaf Lake	6300'	7.0	7.2	103%	8.0	7.7
CARSON RIVER						
Ebbetts Pass	8700'	38.8	50.6	130%	50.5	43.9
Poison Flat	7900'	16.2	23.8	147%	23.8	20.2
WALKER RIVER						
Virginia Lakes	9200'	20.3	26.2	129%	26.2	23.7
Lobdell Lake	9200'	17.3	23.4	135%	23.3	18.8
Sonora Pass Bridge	8750'	26.0	34.7	133%	34.7	30.3
Leavitt Meadows	7200'	8.0	17.0	212%	17.2	15.3
OWENS RIVER/MONO LAKE						
Gem Pass	10750'	31.7	42.5	134%	42.5	36.6
Sawmill	10300'	19.4	28.8	148%	28.8	24.8
Cottonwood Lakes	10200'	11.6	22.7	196%	22.3	20.4
Big Pine Creek	9800'	17.9	24.2	135%	24.2	22.2
South Lake	9600'	16.0	21.1	132%	21.1	18.7
Mammoth Pass (USBR)	9500'	42.4	52.8	124%	52.5	47.2
Rock Creek Lakes	10000'	14.0	20.3	145%	20.2	18.1

NORMAL SNOWPACK ACCUMULATION EXPRESSED AS A PERCENT OF APRIL 1ST AVERAGE

AREA	JANUARY	FEBRUARY	MARCH	APRIL	MAY
Central Valley North	45%	70%	90%	100%	75%
Central Valley South	45%	65%	85%	100%	80%
North Coast	40%	60%	85%	100%	80%

SNOWPACK - Snow data is a major index of spring and summer runoff from Sierra Nevada watersheds. April 1 data historically reflects the magnitude of the snowpack at or near the maximum seasonal accumulation. Averages are based on April 1 data for the period 1946-1995 (50 years, except for data sites established after 1946).

PRECIPITATION - Averages are based on April 1 data for the period 1946-1995 (50 years, except for data sites established after 1946).

RUNOFF AND FORECASTS - Runoff data and runoff forecasts are shown as unimpaired values. Unimpaired runoff represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds. Forecast of runoff assumes median conditions subsequent to the date of forecast.

Runoff probability ranges are statistically derived from historical data. The 80 percent probability range is comprised of the 90 percent exceedence level value and the 10 percent exceedence level value. This means that actual runoff should fall within the stated limits eight times out of ten.

Runoff averages for most streams are based on the period 1946-1995. For more details contact California Cooperative Snow Surveys, P.O. Box 942836, Sacramento, CA 94236-0001, (916) 574-2635 or gridley@water.ca.gov.

INDICES OF WATER AVAILABILITY

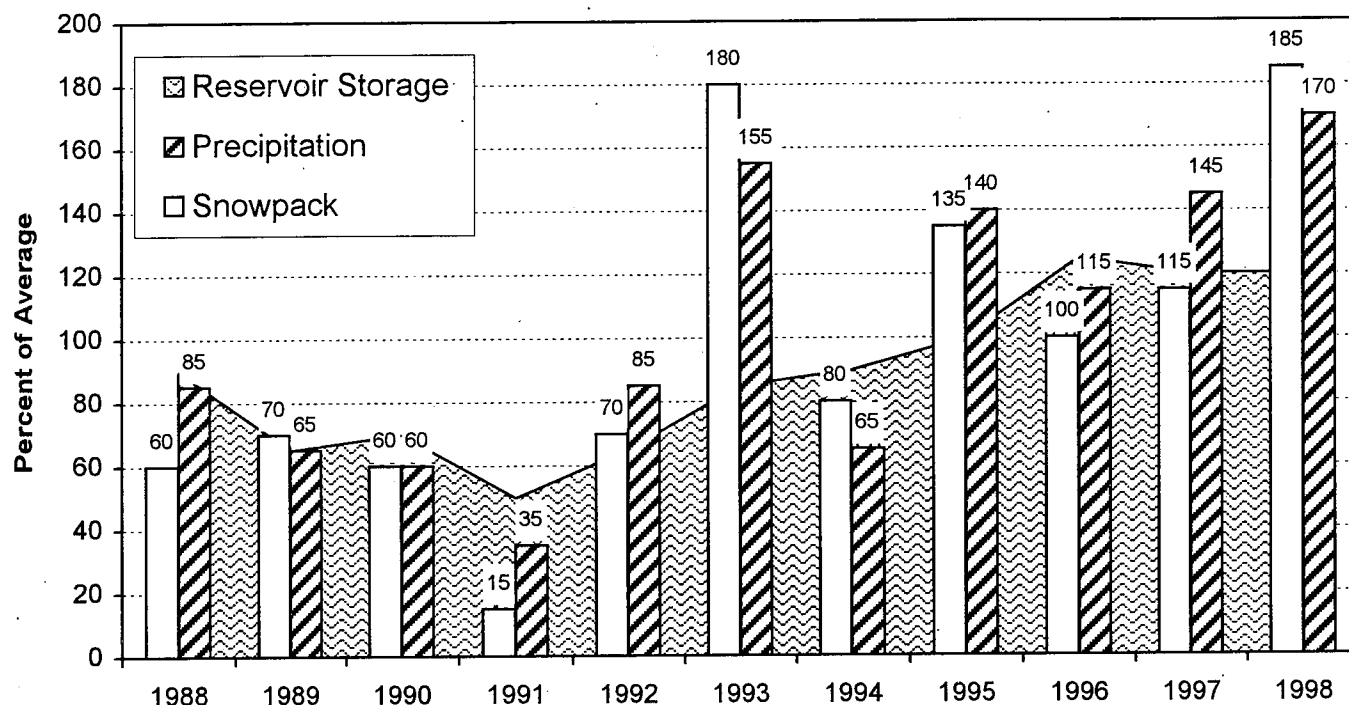
The Sacramento River Hydrologic Region 40-30-30 Water Supply Index. The 40-30-30 represent the percentage weight given to the three variables in the formula for the index. The first variable is the forecasted unimpaired runoff from April through July (40 Percent). The second variable is the forecasted unimpaired runoff from October through March (30 Percent). The third variable is the previous year's index with a cap to account for required flood control releases during wet years. The basins used in this computation are those used in the Sacramento River water year unimpaired runoff.

The Sacramento River water year unimpaired runoff is the sum of: Sacramento River above Bend Bridge, Feather River Inflow to Lake Oroville, Yuba River near Smartville and American River Inflow to Folsom Lake.

The San Joaquin River Hydrologic Region 60-20-20 Water Supply Index. In a similar manner, the 60-20-20 represents the percentage weights on April through July runoff, October through March runoff and previous year's index. The San Joaquin River unimpaired runoff is the sum of: Stanislaus River Inflow to New Melones Lake, Tuolumne River Inflow to New Don Pedro Reservoir, Merced River Inflow to Lake McClure and San Joaquin River Inflow to Millerton Lake.

Prior month unimpaired runoff is the sum of the runoff in the eight major rivers used in the two above indices.

March 1 Statewide Conditions



SNOWLINES

THE PHOTOGRAPH on this month's bulletin cover looks like a distant landscape; but, in reality is wind sculpted snow in Cottonwood meadow. Photo by Dave Hart. The cover photo on last month's bulletin depicts repairs made during mid - January to the packet radio repeater on Trail Peak. Below and to the left is Trail Pass. Again the photographer is Dave Hart.

THE 1998 WESTERN SNOW CONFERENCE annual meeting will be held April 20-23 at Snowbird, Utah. Contact Frank Gehrke at 916-574-2635 or gridley@water.ca.gov for more information. Information on registration and lodging is on a link from our homepage <http://snow.water.ca.gov>.

FEBRUARY storms produced some significant snow accumulations in the Sierra with very impressive amounts in the Trinity Alps and Northern Sierra. On a recent inspection trip of some of the snow sensors in that area, nothing- not even the antenna or solar panel, was above the snow at Shimmy Lake. The sensors at Red Rock Mountain and Stout's Meadow suffered damage to the antennas from snow creep which pulled loose the coax cable and broke the welds on the antenna at Red Rock Mountain and Stout's Meadow.

State of California – The Resources Agency
DEPARTMENT OF WATER RESOURCES
P.O. Box 942836
Sacramento, CA 94236-0001

First Class

